

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>990097 AM</b>	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. <b>PCT/EP 00/08580</b>	International filing date (day/month/year) <b>02/09/2000</b>	(Earliest) Priority Date (day/month/year) <b>27/09/1999</b>
Applicant <b>DEGUSSA-HÜLS AKTIENGESELLSCHAFT et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
  - contained in the international application in written form.
  - filed together with the international application in computer readable form.
  - furnished subsequently to this Authority in written form.
  - furnished subsequently to this Authority in computer readable form.
  - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.  Certain claims were found unsearchable (See Box I).

3.  Unity of invention is lacking (see Box II).

4. With regard to the **title**,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

1

None of the figures.

# INTERNATIONAL SEARCH REPORT

International Application No

/EP 00/08580

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 C12N9/90 C12P41/00 C12N15/61 //C12P41/00,C12R1:19)

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, EMBL, STRAND, MEDLINE, EMBASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PIETZSCH M ET AL.: "Isolation and characterization of a new, non pyridoxal-5'-phosphate dependent hydantoin racemase" DECHEMA BIOTECHNOLOGY CONFERENCES, vol. 4 pt. A, 1990, pages 259-262, XP000991534 the whole document ---	1
Y	US 5 827 717 A (BOMMARIUS ANDREAS ET AL) 27 October 1998 (1998-10-27) column 1, line 65 -column 2, line 3 column 3, line 25-55 column 4, line 38-53 claims 1-6 ---	2-8
Y	US 5 827 717 A (BOMMARIUS ANDREAS ET AL) 27 October 1998 (1998-10-27) column 1, line 65 -column 2, line 3 column 3, line 25-55 column 4, line 38-53 claims 1-6 ---	2-7
		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 March 2001	23/03/2001
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  van de Kamp, M

## INTERNATIONAL SEARCH REPORT

International Application No

EP 00/08580

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BOMMARIUS A S ET AL.: "Membrane bioreactors for the production of enantiomerically pure alpha-aminoacids", CHIRALITY IND. (1992), PP 371-97. EDITOR(S): COLLINS, ANDREW N.; SHELDRAKE, G. N.; CROSBY, J. PUBLISHER: WILEY, CHICHESTER, UK. XP000991099 paragraph '20.1!' - paragraph '20.2!' paragraph '20.4.1.3!' paragraph '20.5!' ---	8
A	WILMS B ET AL.: "Cloning, nucleotide sequence and expression of a new L-N-carbamoylase gene from Arthrobacter aurescens DSM 3747 in E. coli" JOURNAL OF BIOTECHNOLOGY, vol. 68, no. 2-3, 19 February 1999 (1999-02-19), pages 101-113, XP004164275 abstract page 102, left-hand column, line 1-18 page 102, left-hand column, line 41 -right-hand column, line 18 page 112, right-hand column, line 16-23 ---	1-8
A	PIETZSCH M ET AL.: "Immobilization of hydantoin cleaving enzymes from Arthrobacter aurescens DSM 3747 - effect of the coupling method on the stability of the L-N-carbamoylase" PROG. BIOTECHNOL., STABILITY AND STABILIZATION OF BIOCATALYSTS, vol. 15, 1998, pages 517-522, XP000991023 abstract ---	8
A	WOHLFAHRT G ET AL: "Immobilization of hydantoin cleaving enzymes;" DECHEMA BIOTECHNOL. CONF., vol. 5 pt. A, 1992, pages 45-48, XP000991533 page 45, line 1-10 page 48, line 1-17 ---	8
P, X	WIESE A ET AL.: "Hydantoin racemase from Arthrobacter aurescens DSM 3747: heterologous expression, purification and characterization" JOURNAL OF BIOTECHNOLOGY, vol. 80, no. 3, 14 July 2000 (2000-07-14), pages 217-230, XP004214557 the whole document --- -/-	1-8

## INTERNATIONAL SEARCH REPORT

International Application No

EP 00/08580

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>OLIVER M ET AL.: "Inverting enantioselectivity by directed evolution of hydantoinase for improved production of L-methionine"  <i>NATURE BIOTECHNOLOGY</i>, vol. 18, no. 3, March 2000 (2000-03), pages 317-320, XP002154849  abstract  page 320, left-hand column, line 9-13  -----</p>	1-7
E	<p>WO 00 58449 A (DEGUSSA ;CALIFORNIA INST OF TECHN (US)) 5 October 2000 (2000-10-05)  page 8, line 25 -page 9, line 17  example 2  claims 20,26,31  -----</p>	1-8

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

EP 00/08580

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5827717	A 27-10-1998	DE 4316928 A	24-11-1994	AT 196776 T 15-10-2000
		DE 59409542 D	09-11-2000	EP 0625571 A 23-11-1994
		ES 2150452 T	01-12-2000	JP 6343462 A 20-12-1994
		SG 46729 A	20-02-1998	US 5516660 A 14-05-1996
WO 0058449	A 05-10-2000	AU 4178800 A	16-10-2000	